

**Use of Peptides for Protecting Skin  
from Hair-Treatment Agents**

5 The present invention concerns the use of short-chain peptides for protecting the skin from hair-treatment agents, particularly for protecting the scalp from dyes or colorants which are known to be used for dyeing hair.

10 In the treatment of hair with a cosmetic agent, skin contact with the agent cannot always be avoided even when the most careful procedures are used. Such skin contact represents a special drawback in the use of hair colorants. In the main visible regions directly adjacent to the hair roots, such skin staining has a deleterious effect and should be removed or prevented in advance.

15 It is known to prevent this drawback by use of various emulsions as skin protectants before employing hair-treatment agents. In this case, however, the desired effect is attained only insufficiently, particularly in the use of hair colorants.

20 Other agents, for example vaseline, must be removed after the hair treatment and, in addition, they have the drawback that because of their insolubility in water they are very difficult to remove from the skin and hair roots or possibly require the use of a skin-irritating solvent for this purpose.

25 Our goal therefore was to provide preparations intended to prevent skin contact of cosmetic agents, particularly hair colorants, and which would not present the drawbacks of conventional preparations.

30 Surprisingly, we have now found that the use of a preparation containing a short-chain peptide solves in outstanding manner the problem of protecting skin from undesirable contact with agents for cosmetic treatment of hair, particularly of protecting the skin from undesirable staining during the dyeing or tinting of hair.

35 Protection of the skin from undesirable contact with agents for cosmetic treatment of hair refers to agents capable of dyeing, tinting, deforming, hardening, conditioning, softening, repairing or styling hair. These effects and the hair-treatment agents causing such effects are known to those skilled in the art.

Hence, the present invention relates to the use of a preparation containing a short-chain peptide for protecting skin from hair-treatment agents.

40 In particular, the present invention concerns the use of a preparation containing a short-chain peptide for the protection of the skin from hair-treatment agents including hair colorants that can dye, tint, deform, harden, condition, soften, repair or style hair.

More particularly, the present invention concerns the use of a preparation containing a short-chain peptide for protecting skin from hair-treatment agents capable of dyeing or tinting hair and thus possibly staining the skin, particularly the scalp, the said preparation being capable of preventing or reducing such undesirable staining.

By the fact that the use of peptides according to the invention prevents or at least reduces the contact of hair-treatment agents with the skin, undesirable conditions of the skin can be prevented or attenuated. These undesirable conditions comprise, in particular, staining, hypersensitivity reactions, dermatitis, allergic or inflammatory processes and braiding or dandruff formation.

In the dyeing of hair, in particular, the undesirable staining of the part of the head involved presents a special problem for the hairdresser as well as for the private user.

Hence, the use according to the invention for protecting the skin from undesirable skin staining during the dyeing or tinting of hair is particularly preferred.

The short-chain peptides to be used according to the invention have a chain length between 2 and 30 amino acids, preferably between 6 and 15 amino acids and particularly between 6 and 12 amino acids.

In the sense of the present invention, by peptides are meant those the monomers of which consist of amino acids or amino acid derivatives or mixtures thereof that are linked to each other in the usual manner by acid amide bonds. They can be of synthetic (prepared by total industrial synthesis), semisynthetic (obtained by partial synthesis and from natural sources) or natural origin, genetic engineering and microbiological methods of preparation (for example the known methods of DNA recombination) being included.

Also suitable for use are peptides the amino acids of which contain heteroatoms or heteroatom groupings. Suitable amino acid derivatives are, for example, alpha-aminocarboxylic acids with at least three carbon atoms wherein the heteroatoms or heteroatom groups, for example a free amino, hydroxyl, sulfonyl or carboxyl group is preferably linked to the terminal carbon atom.

Hence, the invention also comprises peptides containing amino acid derivatives bearing a free amino, hydroxyl or sulfonyl group.

Particularly preferred are short-chain peptides that are preferably in the form of a dimer or 30-mer, particularly between the trimer and 15-mer and more particularly in the form of a 6-mer to 12-mer. Suitable are, for example, the peptides having the following amino acid sequence (the amino acids are indicated by their known one-letter code):

AAVIQL, ADESKHVWSQT, AFTQGLK, AGTFSTPRKKFKK, AGTVLIEDNNFTNE, ATCESRWT,

ATPSILQTPKTT, AVLTEEDSD, DDEENQSLTTKKES, DDENDSYTDHENI, DDTDEIEND,  
DEENSQT, DEGESTQSVKTPRKK, DELHSA, DENTSENQSE, DENVEDDE, DNEVADN,  
DYTQMPISWKRK, EDEETEQSLPKKEED, EDHWNDPRSAV, EDNRTPTSTAI,  
EDNTQVIPRKSLTWS, EDSYTQSLPKKTS, EDTSTENKNTNDEE, EKHSYTNLSPR,  
5 EKSTANPSQD, ELGQNS, ENDTHMENS, ENSADNDEL, ESEDDMVNTDEE, GAYNYE,  
GNTRKVEVR, IFTAYQSPRKSTI, ISLTQPKRFW, IVRKSATNSLPKKV, KKETQFKRSTKQSLS,  
KKFSQLLK, KKRKKKTKMIKSK, KKRSLIKSRPKS, KKRSTSTQLVKRRT, KKRTRLK,  
KKTRSTLQRKIRK, KRAKRR, KRQSIHSA, KRSKRTKSPKIS, KRWTGCALRKR, LENQEI,  
LITASFTQSLPRKSG, MAFMTQSVHVT, MAVENDES, MEDMEHSENTEIT, MFSTQTLKR,  
10 MGHVQSL, MGTWTQISLPRK, MITQLIPRMS, MLSQTI, MQTISPTARE, MQTSSYIALTMSM,  
MSTAVLA, NDEHDEHKRVKT, NDSQLDKT, NEDDEFSSSPRKKT, NEIDEG,  
NEMVLTQSHNEDE, NEYILDQTLED, NKASIEEDNDPNIRS, NMCTQNLLRKT MSE,  
NNDECWSAT, NNSPSEETEA, NVRKKLK, RAKRITKFTQSIPKK, RGKKLHRTV, RIKRRSYSTS,  
RISKKRTYST, RKKSKAVKKI, RKSRLIYHKMKK, RKVSQLT, RRQSLLTKKAR,  
15 RSTIRTHQLKKR, RVHYKK, SAKISKKRSSKPSAV, SATLAHI, SMMSTLYSWSEDMT,  
SSVTQSLGVIHFYS, STASDHSS, STAVRRSL, SVGLITQSSLPKKSV, TGTSLQHYQSSL,  
TIAVYTPRKS, TKKRKITQSPEERK, TTQSIKTI, TWSAVHSPQST, VASTSTQSLPTSWS,  
VGTQSI, VKKRSRSKKKL, VQSAWCTSAD, VSIEDNTEA, VSMENQSA, VSQLSTSQLLTS,  
VTSLLRA.

20 The detection and selection of a peptide suitable for the purpose of the present invention can be  
done by methods that in and of themselves are known and are known to those skilled in the art.  
Such a method can be carried out *in vivo* or *in vitro* and is based on simple comparative testing.  
Suitable for this purpose are, for example, pigskin preparations the surface of which is treated with  
25 a composition containing a peptide of the invention, and using as a control a composition devoid  
of a peptide. These skin preparations are then brought in contact with a selected cosmetic agent,  
for example a hair colorant, which after a certain exposure time is again washed out. Thereafter,  
the amount of the cosmetic agent, for example a dye, left on the skin preparations can be deter-  
mined quantitatively.

30 Preferably comprised are peptides which in aqueous solution specifically bind to the skin surface  
in the pH range between pH 4.0 and pH 8.5 and preferably between pH 5.0 and pH 6.0.

35 The peptides suitable according to the present invention can be prepared by known methods or  
obtained commercially, for example from ORPEGEN Pharma, Heidelberg. Thus, a peptide of the  
desired chain length can be synthesized by a routine method, for example by the generally known  
Merrifield technique.

40 Moreover, suitable peptides can be identified by screening of phage peptide libraries (also known  
as "phage displays", for example as described by Devlin JJ et al., Science 249, 404-406, 1990) or

by further optimization via the "Cosmix-Plexing" method according to WO98/33901.

In principle, all known amino acid can be considered for selecting amino acids suitable for the synthesis of the peptide, particularly alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine and valine.

The hair-treatment agents the contact of which is to be prevented or reduced by use of a peptide according to the invention include dyeing or color-imparting, conditioning, deforming, hardening, softening, styling, repairing and/or reconstituting hair-treatment agents.

The said hair-treatment agents include, for example, cationic polymers, cationic surfactants, amidoamines, betaine esters, esterquats, silicone polyols, synthetic polymers, for example acrylic polymers, dyeing or coloring hair-treatment agents including oxidative, nonoxidative, direct, natural, synthetic and semisynthetic dyes, where by direct dyes are meant nitro dyes, azo dyes, quinone dyes, triphenylmethane dyes and acid and basic dyes.

The term hair-treatment agent also comprises the reactive dyes containing a triazinyl, sulfatoethylsulfonyl or vinylsulfonyl group, for example Reactive Blue 2, Reactive Blue 19, Reactive Red 2, Reactive Orange 16, Reactive Black 5 and Reactive Yellow 2.

According to the invention, the skin is also protected from dye precursors. Dye precursors are, for example, the halogenated nitrobenzene derivatives capable of reacting with compounds having a free amino or hydroxyl group to form nitro dyes. Examples are 4-fluoro-3-nitroaniline, 5-fluoro-2-nitroaniline, 1-chloro-2,4-dinitrobenzene and 1-fluoro-2,4-dinitrobenzene..

Suitable blue nitro dyes are, for example:

1,4-bis[(2'-hydroxyethyl)amino]-2-nitrobenzene,

1-(2'-hydroxyethyl)amino-2-nitro-4-bis-(2"-hydroxyethyl)aminobenzene (HC Blue No. 2),

1-amino-3-methyl-4-(2'-hydroxyethyl)amino-6-nitrobenzene (HC Violet No. 1),

4,N-ethyl,N-(2"-hydroxyethyl)amino-1-(2"-hydroxyethyl)amino-2-nitrobenzene hydrochloride (HC Blue No. 12),

4-bis-(2'-hydroxyethyl)amino-1-(2"-methoxyethyl)amino-2-nitrobenzene (HC Blue No. 11),

1-(2',3'-dihydroxypropyl)amino-2-nitro-4-[N-methyl-(2"-hydroxyethyl)amino]benzene hydrochloride (HC Blue No. 10),

1-[(2',3'-dihydroxypropyl)amino]-2-nitro-4-[N-ethyl-(2"-hydroxyethyl)amino]benzene hydrochloride (HC Blue No. 9),

1-(3'-hydroxypropyl)amino-2-nitro-4-bis-(2"-hydroxyethylamino)benzene (HC Violet No. 2),

4,N-methyl,N-(2',3'-dihydroxypropyl)amino-1-methylamino-2-nitrobenzene hydrochloride (HC Blue No. 6) and

4'-amino-2'-nitro-2''-carboxy-4''-dimethylaminodiphenylamine (HC Blue No. 13).

Suitable red nitro dyes are, for example:

- 1-amino-4-(2'-hydroxyethyl)amino-2-nitrobenzene (HC Red No. 7),
- 5 1-hydroxy-2-amino-4,6-dinitrobenzene,
- 4-amino-2-nitrodiphenylamine (HC Red No. 1),
- 1-amino-2-nitro-4-bis-(2'-hydroxyethyl)aminobenzene hydrochloride (HC red No. 13),
- 1-amino-2-nitro-4-(2'-hydroxyethyl)amino-5-chlorobenzene,
- 1-(2'-hydroxyethyl)amino-2-nitro-4-aminobenzene (HC Red No. 3),
- 10 1-hydroxy-3-nitro-4-aminobenzene,
- 1-hydroxy-3-nitro-4-(2'-hydroxyethylamino)benzene,
- 1-(2'-aminoethyl)amino-2-nitro-4-(2'-hydroxyethoxy)benzene (HC Orange No. 2),
- 3-nitro-4-(2'-hydroxyethyl)aminophenylglycerol ether (HC Orange No. 3),
- 1-amino-5-chloro-4-(2',3'-dihydroxypropyl)amino-2-nitrobenzene (HC Red No. 10),
- 15 1,4-bis-[(2',3'-dihydroxypropyl)amino]-5-chloro-2-nitrobenzene (HC red. No. 11),
- 1-hydroxy-2-(2'-hydroxyethyl)amino-4,6-dinitrobenzene,
- 3-nitro-4-ethylaminobenzoic acid,
- 4-amino-2-nitrodiphenylamino-2-carboxylic acid,
- 2-chloro-6-ethylamino-4-nitrophenol,
- 20 2-amino-6-chloro-4-nitrophenol,
- 1-hydroxy-3-nitro-4-(3'-hydroxypropylamino)benzene,
- 2,5-diamino-6-nitropyridine,
- 1,2,3,4-tetrahydro-6-nitroquinoxaline and
- 7-amino-3,4-dihydro-6-nitro-2H-1,4-benzoxazine (HC Red 14).

Suitable yellow nitro dyes are, for example:

- 1-amino-2-(2'-hydroxyethyl)amino-5-nitrobenzene (HC Yellow No. 5),
- 1-(2'-hydroxyethoxy)-2-(2''-hydroxyethyl)amino-5-nitrobenzene (HC Yellow No. 4),
- 1-(2'-hydroxyethyl)amino-2-nitrobenzene (HC Yellow No. 2)
- 30 1-methoxy-2-(2'-hydroxyethyl)amino-5-nitrobenzene,
- 1-hydroxy-2-amino-3-nitrobenzene,
- 1-amino-2-methyl-6-nitrobenzene,
- 1-(2'-hydroxyethyl)oxy-3-methylamino-4-nitrobenzene,
- 1-methylamino-2-nitro-5-(2',3'-dihydroxypropyl)oxybenzene,
- 35 1-(2'-hydroxyethyl)amino-2-hydroxy-4-nitrobenzene (HC Yellow No. 11),
- 1-methoxy-3-(2'-aminoethyl)amino-4-nitrobenzene hydrochloride (HC Yellow No. 9),
- 1-(2'-ureidoethyl)amino-4-nitrobenzene,
- 4-(2',3'-dihydroxypropyl)amino-3-nitrotrifluoromethylbenzene (HC Yellow No. 6),
- 2,4-bis-[N-(2'-hydroxyethyl)amino]-5-chloronitrobenzene (HC Yellow No. 10),
- 40 4-(2'-hydroxyethyl)amino-3-nitromethylbenzene,

4-(2'-hydroxyethyl)amino-3-nitrochlorobenzene (HC Yellow No. 12),  
4-(2'-hydroxyethyl)amino-3-nitrotrifluoromethylbenzene (HC Yellow No. 13),  
4-(2'-hydroxyethyl)amino-3-nitrobenzonitrile (HC Yellow No. 14),  
4-(2'-hydroxyethyl)amino-3-nitrobenzamide (HC Yellow No. 15).

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Suitable azo dyes are, for example:

1-(4'-nitrophenylazo)-2-methyl-4-bis-(2'-hydroxyethyl)aminobenzene,  
1-(3'-nitro-4-amino)phenylazo-2-hydroxy-7-trimethylammonium naphthalene chloride,  
1-(2'-hydroxy-4'-sulfo-6'-nitro)naphthylazo-2-hydroxynaphthalene, CI 15700,  
10 1-(4'-aminophenylazo)-2-methyl-4-bis-[(2'-hydroxyethyl)amino]benzene,  
5-(4'-dimethylaminophenylazo)-1,4-dimethyltriazonium chloride,  
1-(2'-methoxyphenylazo)-2-hydroxy-7-trimethylammonium naphthalene chloride,  
1-(4'-aminophenylazo)-2-hydroxy-7-trimethylammonium naphthalene,  
4-(3'-trimethylammoniumphenylazo)-N-phenyl-3-methylpyrazolone (5),  
15 4-hydroxy-3-[(4'-sulfo-1'-naphthyl)azo]-1-naphthalenesulfonic acid,  
1-(4'-sulfophenylazo)-2-hydroxynaphthalene,  
1-(4'-sulfophenylazo)-2-hydroxy-6-sulfonaphthalene, CI 15985,  
4-amino-[4'-bis-(2"-hydroxyethyl)amino]azobenzene,  
4-amino-[4'-bis-(2"-hydroxyethyl)amino]-2'-methylazobenzene,  
20 3-(2',6'-diaminopyridyl-3'-azo)pyridine,  
7-phenylazo-1-amino-3,6-disulfo-8-hydroxynaphthalene,  
5-acetyl-amino-4-hydroxy-3-[(2'-methylphenyl)azo]-2,7-naphthalenedisulfonic acid and  
2-(2',4'-dimethylphenylazo)-6-(4"-sulfophenylazo)-1,3-dihydroxybenzene.

25 Suitable quinone dyes are, for example:

1,4-bis-(2',3'-dihydroxypropyl)aminoanthraquinone,  
1-methylamino-4--(2'-hydroxyethyl)aminoanthraquinone,  
2-(2'-aminoethyl)aminoanthraquinone,  
2-bromo-4,8-diamino-6-(3'-trimethylammonium)phenylamino-1,5-naphthoquinone,  
30 1-(2'-sulfo-4'-methylphenyl)amino-4-hydroxyanthraquinone,  
1,4-diaminoanthraquinone,  
1-amino-2-sulfo-4-cyclohexylaminoanthraquinone,  
1-methylamino-4-aminopropylaminoanthraquinone,  
1-aminopropylaminoanthraquinone,  
35 1,4-diamino-2-methoxyanthraquinone and  
1,4-bis-(2-hydroxyethyl)amino-5,8-dihydroxyanthraquinone.

Suitable triphenylmethane dyes are, for example:

4',4'',4'''-triamino-3-methyltriphenylcarbonium chloride,  
40 bis-(4,4-diethylaminophenyl)-4'-ethylaminonaphthylcarbonium chloride,

bis-(4,4-dimethylaminophenyl)-4'-phenylaminonaphthylcarbonium chloride, Basic Blue 26, CI 44045, and  
4,4-bis-(N-ethyl-3-sulfobenzyl)amino-2"-sulfofuchsonium.

- 5 Suitable acid dyes are, for example:  
1-(4'-sulfophenylazo)-2-hydroxy-6-sulfonaphthalene, CI 15 985,  
1-(2'-hydroxy-4'-sulfo-6'-nitro)naphthylazo-2-hydroxynaphthalene, CI 15 700,  
2,4-dinitro-1-naphthol-7-sulfonic acid disodium salt (Acid Yellow 1; CI 10 316),  
2-(2'-quinolyl)-1H-indene-1,3(2H)-dione monosulfonic acid disodium salt (Acid Yellow 3; CI 47  
10 005),  
4,5-dihydro-5-keto-1-(4'-sulfophenyl)-4-[(4"-sulfophenyl)azo]-1H-pyrazole-3-carboxylic acid trisodi-  
um salt (Acid Yellow 23; CI 19 140),  
3',6'-dihydroxyspiro[isobenzofuran-1(3H),9'(9H)-xanthen]-3-one (Acid Yellow 73; CI 45 350:1),  
5-[2',4'-dinitrophenyl]amino]-2-(phenylamino)benzenesulfonic acid sodium salt (Acid Orange 3; CI  
15 10 385),  
4-[(2',4'-dihydroxyphenyl)azo]benzenesulfonic acid sodium salt (Acid Orange 6; CI 14 270),  
4-[2'-hydroxy-1'-naphthyl]azo]benzenesulfonic acid sodium salt (Acid Orange 7; CI 15 510),  
4-[(3'-[(2",4"-dimethylphenyl)azo]-2',4'-dihydroxyphenyl)azo]benzenesulfonic acid sodium salt  
(Acid Orange 24; CI 20 170),  
20 4-hydroxy-3-[(4'-sulfo-1'-naphthyl)azo]-1-naphthalenesulfonic acid disodium salt (Acid Red 14; CI  
14 720),  
7-hydroxy-8-[(4'-sulfo-1'-naphthyl)azo]-1,3-naphthalenedisulfonic acid trisodium salt (Acid Red 18;  
CI 16 255),  
3-hydroxy-4-[(4'-sulfo-1'-naphthyl)azo]-2,7-naphthalenedisulfonic acid trisodium salt (Acid Red 27;  
25 CI 16 185),  
5-amino-4-hydroxy-3-phenylazo-2,7-naphthalenedisulfonic acid disodium salt (Acid Red 33; CI 17  
200),  
5-(acetylamino)-4-hydroxy-3-[(2'-methylphenyl)azo]-2,7-naphthalenedisulfonic acid disodium salt  
(Acid Red 35; CI 18 065),  
30 3',6'-dihydroxy-2',4',5',7'-tetraiodospiro[isobenzofuran-1(3H),9'(9H)-xanthen]-3-one disodium salt  
(Acid Red 51; CI 45 430),  
3,6-bis-(diethylamino)-9-(2',4'-disulfophenyl)xanthylium hydroxide sodium salt (Acid Red 52; CI 45  
100),  
7-hydroxy-8-[[4'-(phenylazo)phenyl]azo]-1,3-naphthalenedisulfonic acid disodium salt (Acid Red  
35 73; CI 27 290),  
2',4',5',7'-tetrabromo-3',6'-dihydroxyspiro[isobenzofuran-1(3H),9'(9H)-xanthen]-3-one disodium salt  
(Acid Red 87; CI 45 380),  
2',4',5',7'-tetrabromo-4,5,6,7-tetrachloro-3',6'-dihydroxyspiro[isobenzofuran-1(3H),9'(9H)-xanthen]-  
3-one disodium salt (Acid Red 92; CI 45 410),  
40 3',6'-dihydroxy-4',5'-diiodospiro[isobenzofuran-1(3H),9'(9H)-xanthen]-3-one disodium salt (Acid

Red 95; CI 45 425),  
 Acid Red 195; Acid Blue 9 (CI 42 090),  
 2,2'-[(9,10--dihydro-9,10-diketo-1,4-anthracenediyl)diimino]-bis-(5-methylbenzenesulfonic acid) di-  
 sodium salt (Acid Green 25; CI 61 570),  
 5 N-[4-[(4'-(dimethylamino)phenyl)-(2"-hydroxy-3",6"-disulfo-1"-naphthyl)methylene]-2,5-  
 cyclohexadien-1-ylidene]-N-methylmethanaminium hydroxide (Acid Green 50; CI 44 090),  
 N-[4-[(4'-(diethylamino)phenyl)-(2",4"-disulfophenyl)methylene]-2,5-cyclohexadien-1-ylidene]-N-  
 ethylethanaminium hydroxide sodium salt (Acid Blue 1; CI 42 045),  
 N-[4-[(4'-(diethylamino)phenyl)-(5"-hydroxy-2",4"-disulfophenyl)methylene]-2,5-cyclohexadien-1-  
 10 ylidene]-N-ethylethanaminium hydroxide calcium salt (Acid Blue 3; CI 42 051),  
 1-amino-4-(cyclohexylamino)-9,10-dihydro-9,10-diketo-2-anthracenesulfonic acid sodium salt  
 (Acid Blue 62; CI 62 045),  
 2-(1',3'-dihydro-3'-keto-5'-sulfo-2'H-indol-2'-ylidene)-2,3-dihydro-3-keto-1H-indole-5-sulfonic acid  
 disodium salt (Acid Blue 74; CI 73 015),  
 15 9-(2'-carboxyphenyl)-3-[(2"-methylphenyl)amino]-6-[(2""-methyl-4""-sulfophenyl)amino]xanthylum  
 hydroxide sodium salt (Acid Violet 9; CI 45 190),  
 2-[(9',10'-dihydro-4'-hydroxy-9',10'diketo-1'-anthracenyl)amino]-5-methylbenzenesulfonic acid so-  
 dium salt (Acid Violet 43; CI 60 730),  
 3,3'-[sulfonyl-bis-(2-nitro-4,1-phenylene)imino]-bis-[6-(phenylamino)benzene disodium sulfonate  
 20 (Acid Brown 13; CI 10 410),  
 4-amino-5-hydroxy-3-[(4'-nitrophenyl)azo]-6-(phenylazo)-2,7-naphthalenedisulfonic acid disodium  
 salt (Acid Black 1; CI 20 470),  
 3-hydroxy-4-[(2'-hydroxy-1'-naphthyl)azo]-7-nitro-1-naphthalenesulfonic acid sodium salt (Acid  
 Black 52; CI 15 711) and  
 25 3-[(2,4-dimethyl-5-sulfophenyl)azo]-4-hydroxy-1-naphthalenesulfonic acid (Ponceau SX, CI 14  
 700),  
  
 Suitable basic dyes are, for example:  
 bis-(4,4-dimethylaminophenyl)-4'-phenylaminonaphthylcarbonium chloride (Basic Blue 26; CI  
 30 44 045),  
 N-{4-[(4'-diethylamino)phenyl]-[4"--(ethylamino)-1"-naphthyl]methylene}-2,5-cyclohexadien-1-  
 ylidene-N-ethylethanaminium chloride (Basic Blue 7; CI 42 595),  
 4-[(4'-aminophenyl)-(4'-imino-2',5'-cyclohexadien-1'-ylidene)methyl]-2-methylaminobenzene  
 hydrochloride (Basic Violet 14; CI 42 510),  
 35 4-(acetyl-amino)-5-hydroxy-6-[[7'-sulfo-4'-[(4"-sulfophenyl)azo]-1'-naphthyl]azo]-1,7-  
 naphthalenedisulfonic acid tetrasodium salt (Brilliant Black 1; CI 28 440),  
 [8-(p-aminophenyl)azo]-7-hydroxy-2-naphthyl]trimethylammonium chloride (Basic Brown 16; CI  
 12 250),  
 [8-[4'-amino-2'-nitrophenyl)azo]-7-hydroxy-2-naphthyl]trimethylammonium chloride (Basic Brown  
 40 17; CI 12 251),



7-hydroxy-8-[(2'-methoxyphenyl)azo]-N,N,N-trimethyl-2-naphthylammonium chloride (Basic Red 76; CI 12 245),

3-[(4'-amino-6'-bromo-5',8'-dihydro-1'-hydroxy-8'-imino-5'-keto-2'-naphthyl)amino]-N,N,N-trimethylammonium chloride (Basic Blue 99; CI 56 059) and

5 4-(3'-trimethylammoniumphenylazo)-N-phenyl-3-methylpyrazol-5-one (Basic Yellow 57; CI 12 719).

10 The amount of peptide to be applied to the skin depends on the amount and kind of the hair-treatment agent used. The short-chain peptide is used in the form of an aqueous solution. A ready-to-use aqueous solution can contain from 0.01 to 100 mg of peptide/mL, particularly from 0.1 to 50 mg/mL, more particularly from 0.25 to 40 mg/mL and preferably from 1.0 to 25 mg of peptide/mL.

15 In addition, the aqueous solution can contain auxiliary agents, particularly antioxidants (for example tocopherol derivatives), complexing agents [for example ethylenediaminetetraacetic acid (EDTA) or diethylenetriaminepentaacetic acid (DTPA), nitriloacetic acid (NTA) or hydroxyethylenediaminetriacetic acid (HEDTA), a buffer (for example a citrate buffer, citrate-phosphate buffer or phosphate buffer), preservatives or antimicrobial agents (for example, a parahydroxybenzoate ester, benzyl alcohol, and butyl, propyl and methylparabens, sodium hydroxymethylaminoacetate, 20 methylisothiazolinone, phenoxyethanol or Quaternium-15), perfumes, moisturizers, (for example dimethicone silicone, lanolin and lanolin alcohols, amino acids, panthenol, sorbitol, glycerol or propylene glycol), viscosity modifiers (for example, methylcellulose, xanthan gum, hydroxyethylcellulose, methylhydroxyethylcellulose, polyvinylpyrrolidone, an acrylic copolymer or carbomers).

25 The application or formulation of the short-chain peptides can be done in several ways using fluid, viscous, creamy to pasty formulations. Thus, a composition containing a short-chain peptide can be aqueous or in the form of a lotion, gel, paste or cream.

30 In the event that the skin must not only be protected from hair-treatment agents but in addition is to receive care, the short-chain peptide can be combined with a care agent. Hence, the present invention includes the use of a preparation containing a short-chain peptide for the protection of the skin from hair-treatment agents and simultaneously for skin care.

35 This double action can be attained by coupling at least one care agent with a short-chain peptide molecule by a known chemical method.

Suitable for this purpose are, for example: protein hydrolyzates (for example from wheat), amidoamines, moisturizers such as lactates (for example cetyl lactate), vitamins or provitamins or vitamin precursors, for example panthenol and derivatives thereof, biotin, tocopherols, sugars for 40 example polysaccharides, oligosaccharides, glucose, fructose or inulin, organic-chemical UV

filters, all known UVA, UVB and UVA/UVB filter substances being suitable either alone or in combination with one another, for example the derivatives of dibenzoylmethane (for example Parsol 1789 supplied by Givaudan/Roure, INCI designation butyl methoxydibenzoylmethane), benzylidenecamphor or derivatives thereof, particularly methylbenzylidenecamphor [for example (3-benzylidenecamphor or 3-(4-methylenebenzylidene)-d,l-camphor], derivatives and esters of cin-namic acid, particularly the derivatives and esters of methoxycinnamic acid (for example octyl 4-methoxycinnamate or isopentyl 4-methoxycinnamate), derivatives and esters of benzoic acid particularly of 4-aminobenzoic acids, polyhydroxybenzoic acid (for example methyl polyhydroxybenzoate or propyl polyhydroxybenzoate), esters of salicylic acid [for example (2-ethylhexyl) salicylate or (4-isopropylbenzyl) salicylate], sulfonic acids, benzophenones and derivatives thereof, for example the sulfonic acid derivatives of benzophenones (for example 2-hydroxy-4-methoxybenzophenone-5-sulfonic acid) as UVB/UVA filters or of the benzimidazoles (for example 2-phenyl-benzimidazole-5-sulfonic acid) and the salts thereof, dibenzoylmethanes or suitable polypeptides, particularly oxygen radical scavengers, for example the known Mn, Fe or Zn peroxide dismutases, as well as tocopherols and vitamins (for example ascorbic acid).

The said care agents can be present in a total amount between 0.001 and 30.0 wt.%, particularly between 0.01 and 25.0 wt.%, more particularly between 0.1 and 15 wt.% and preferably between 0.5 and 10.0 wt.%, based on the amount of the cosmetic agent to be used.

Legend for the figures:

Figure 1

Pigskin preparations after treatment with a dye solution according to Example 2. The dyeing was done as in Example 4. Before the dyeing, the preparation on the left was pretreated with a peptide solution according to Example 3, while the one on the right was not pretreated in this manner.

The following examples will explain the present invention in greater detail.

### **Example 1 - Making the Pigskin Preparations**

Fresh parts of pigskin (Central-European domestic pig) were thoroughly cleaned with a conventional mild shampoo to remove contamination left from the removal procedure or by hand contact. From these skin specimens, approximately 5.0 x 5.0 cm parts were cut out and each part was placed in a separate Petri dish.

## Example 2 - Preparation of a Dye Solution

A solution having the following composition was prepared

Raw Material	Amount, wt.%
Natrosol 250 HHR <sup>1</sup>	1.0
Nip Nip <sup>2</sup>	0.2
Ethanol (96%)	5.0
Plantaren 2000 UP <sup>3</sup>	5.0
Demineralized water	88.8
	100

<sup>1</sup> Hydroxyethylcellulose

<sup>2</sup> Methyl paraben 0.14% + propyl paraben 0.06%

<sup>3</sup> Decylglucoside (Cognis)

Natrosol 250 HHR and about one third of the water was heated with stirring (magnetic stirrer) to approximately 55 °C until the solution became viscous. Ethanol, Plantaren 2000 UP, Nip Nip and 0.4 wt.% of dye (Basic Violet 14) were mixed with the second third of the water and then brought to a boil. The hot dye solution was added to the Natrosol solution with stirring (magnetic stirrer). The remainder of the water was used to rinse the dye container and was then added to the prepared mixture. In a cold water bath, the mixture was then cooled to room temperature with slow stirring (magnetic stirrer).

The pH can be adjusted to 6.0 at about 30 °C with sodium hydroxide solution or citric acid, fluctuations of about pH 0.9 being tolerable.

## Example 3 - Treatment of Skin Specimens with a Short-Chain Peptide

We prepared 10-mL portions of an aqueous 5.0 mg/mL solution of a peptide having the sequence LITASFTQSLPRKSG.

Ten mL of this peptide solution was applied with a Pasteur pipette to a skin specimen obtained as in Example 1. The solution was then left on the skin specimen until it dried. Complete drying was achieved within about 10 minutes with the aid of a hair drier.

After 30 minutes, the skin specimens were rinsed with tap water for 2 minutes, placed in a new Petri dish and again dried with a hair drier.

#### **Example 4 - Dyeing the Skin Specimens**

- 5 The entire surface of the skin specimens treated according to Example 3 as well as of those that were not treated with the short-chain peptide (controls) was covered with the dye solution prepared as in Example 2 by use of a brush. After an exposure time of 30 minutes, the skin specimens were rinsed under tap water for 2 minutes while being rubbed with the fingers. The specimens were then transferred to a Petri dish and dried with a hair drier.
- 10 The result we found was that the skin specimens treated with the two peptides showed only very minor staining compared to the untreated skin specimens.